

NOTES ON THE GENUS *STENOCHITON* AND THE DISCOVERY
AND RECOGNITION OF THE TYPE OF BLAINVILLE'S
CHITON LONGICYMBA IN *STENOCHITON JULOIDES*, ADAMS
AND ANGAS.

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THIS remarkable genus of Polyplacophora, while evidently rightly placed under the Ischnochitonidæ, in habits and characters its members are evidently widely removed from any other known form.

Instead of harbouring or living on stones, shells, or blocks of timber, the members of this genus have as their host and probably their food supply, various species of that order of marine flowering plants known as Sea Grasses.

The genus *Stenochiton* was formed by Adams and Angas in 1864, for the reception of the South Australian shell described by them under the name *S. juloides* (Proc. Zool. Soc., 1864, p. 193). As shown later, the same shell had been described by De Blainville in 1825, under the name of *Chiton longicymba*, from a specimen collected by Péron and Lesueur, at King Island in 1803.

The next species, *S. pilsbryanus*, was described by Bednall in 1897 (Proc. Malac. Soc., vol. ii, pt. 4) as having been found "on sea-weed? *Zostera*". This being the first intimation of the possibility of its habitat being other than rocks, etc. In 1900 the writer described a third species under the name of *S. pallens*, Ashby. In May, 1918, he read a paper before the Royal Society of S. Australia showing that Bednall's description did not apply to any particular species, but that the figures and description were a sort of conglomerate made up from parts of two or more species. In the same paper he described two more forms under the names of *posidonialis*, Ashby, and *cymodocealis*, Ashby, and finally in a paper read before the same Society in July, 1919, he described a further species as *pilsbryanus*, Bednall.

It will be seen that we have five known species all described from South Australia.

Habitat.—The writer in his paper (Trans. Roy. Soc. of S. Austr., vol. xlii, 1918) was able to show that all the members of this genus live, not as had been previously supposed on "*Pinna* shells, old boots, glass bottles", or on rocks, but on the growing stems and leaves of flowering plants known as "Sea Grasses", being found during the day time hidden away in the brown sheaths of old *Posidonia* leaves, usually buried several inches deep in coarse shell grit and sand. They probably come out at night time and feed on the leaves of growing *Posidonia*, only returning as day approaches to the protection of the sheaths near the roots of the plant. One needs a digging tool to get the plant up by the roots, and then in sheltered localities the *Stenochiton* is found to be quite common.

The characters differentiating these shells from any other known forms are undoubtedly developed as a result of their peculiar environment.

The publication of the writer's monograph on this genus in 1918 has led to the discovery of several of these forms in large numbers, and he was himself able in 1920, on the occasion of a brief visit to Western Australia, to extend their known range westward for about 3,000 miles of coast line. He can truthfully say that since understanding the habits of these *Stenochitons* he has been able to find the species known as *S. cymodocealis*, Ashby, in every locality he has visited in South and West Australia where the sea-grass *Cymodocea* occurs.

As representatives of sea-grasses are found in suitable localities throughout the world, it will be quite safe to assume that representatives of this genus or some kindred form should be found in all these localities when properly searched for.

STENOCHITON LONGICYMBA, Blainville, 1825.

(= *S. juloides*, Ad. and Ang., Proc. Zool. Soc., 1864, p. 193; loc. cit., 1865, p. 58, pl. xi, f. 15. Angas, Proc. Zool. Soc., 1865, p. 188, = *S. juloides*, Ad. and Ang., of Pilsbry (Man. Con., vol. xiv, p. 55), non *Ischnochiton longicymba*, Quoy et Gaimard, auct. = *S. juloides*, Ad. and Ang., of Ashby (Trans. Roy. Soc. of S. Austr., xlii, 1918, and Journ. and Proc. Roy. Soc. of W. Austr., vol. vi, pt. 2, 1919-20), Auct.)

Messrs. Iredale and May in their paper "Misnamed Tasmanian Chitons" (Proc. Malac. Soc., vol. xii, Nov., 1916, p. 105), state with regard to Rochebrune's *Schizochiton nympha* (Bull. Soc. Philom. Paris, Sér. vii, tom. viii, 1884, p. 36), from King Island, collected by Péron and Lesueur, that from Dr. Thiele's description and figure: "There is certainty that Rochebrune renamed the Blainvillean species, and that *Chiton longicymba*, Blainville, is a *Stenochiton*. Thiele does not definitely make this a synonym of *Stenochiton juloides*, Ad. and Ang., and until King Island specimens are again collected, we prefer to allow *Stenochiton longicymba* (Blainville) as a separate species."

During the first week of August last (1922) I had, through the courtesy of Dr. Lamy, an opportunity of examining the collections of Polyplacophora in the Museum d'Histoire Naturelle in Paris.

Rochebrune's type of his *Schizochiton nympha* was on a card, and I am delighted to be able to confirm Messrs. Iredale and May's surmise that it is the lost type of Blainville's *Chiton longicymba*, and that it is a *Stenochiton*. I have not the slightest hesitation in stating that it is quite a typical shell of the species that was described by Adams and Angas under the name of *Stenochiton juloides* in 1864.

The type is mounted on a card, measures 32 by 6 mm., girdle absent. It is a typical specimen of the shell known as *S. juloides*,

Ad. and Ang., long, narrow, smooth, well-defined raised lateral areas, brown flecked with white, a common coloration with this species.

Dr. Lamy kindly made the following literal translation of Blainville's description of his *C. longicymba* for me: "Body very elongate, very narrow, limb with very small, farinaceous scales, shell very long, formed of eight large valves, increasing from the anterior to the posterior, convex and perfectly smooth, the intermediates with broad lateral areas distinguished by one angular prominence; colour greenish-brown, variegated or streaked with small white spots which are wider upon the dorsal line." This description absolutely accords with the specimen upon the card and in no sense will agree with any other of the specimens collected by Péron and Lesueur that are in the collections in Paris.

Dr. Lamy found a manuscript description in the handwriting of Rochebrune, headed "*Lepidopleurus longicymba*, Blainville, *Chiton longicymba*, Blainville (Dict. Sci. Nat., vol. xxxvi, p. 542). Dufresne admoram". In which he states that the type was then in the Paris Museum and giving the measurement, long. 0.99, lat. 0.12. Probably allowance had been made for the width of the girdle, which is now absent. Rochebrune seems later to have decided to redescribe this shell under the name of *Schizochiton nympha*, and in the letterpress gives the measurements as 32 by 11 mm. The length is correct, but the width is absolutely wrong, being twice its present actual width.

The question may very naturally be asked, how was it that only eight years after Blainville's publication of his description of *Chiton longicymba*, Blainville still being connected with the Paris Museum, could Quoy and Gaimard publish in 1833, in the Voyage de l'Astrolabe, a description of a strikingly different shell from New Zealand, now known as *Ischnochiton maorianus*, Iredale, under the name of *Chiton longicymba*, Blainville?

By no stretch of imagination can the New Zealand shell found by Quoy and Gaimard be made to resemble Blainville's shell.

I saw in the Paris Museum Quoy and Gaimard's type from which their description and figures were made, and it is certainly con-specific with the shell named by Iredale *I. maorianus*. On another card are two specimens of the same New Zealand shell, one of them the black variety with white dorsal stripe; this is marked in the handwriting of Quoy, or Gaimard, "*var. lineolatus*, Blainville," very naturally confusing it with the variety of that species that was later on named by Pilsbry *var. haddoni*.

I have shown in earlier papers that Blainville's *lineolatus* is the shell that we have generally known as *Ischnochiton crispus*, Reeve, a species that very closely approaches to the New Zealand shell discovered by Quoy and Gaimard, and they would then have been fully justified in considering them con-specific, the chief difference being in the girdle scales.

Through some mishap the unique type of *C. longicymba*, Bl., must have been mislaid, and Quoy and Gaimard must have been shown Blainville's *Chiton lineolatus* as being *longicymba*. Had they carefully reread Blainville's original description they would at once have recognized the error.

I have often been asked how it was possible for Quoy and Gaimard to have made such a mistake? I think the evidence adduced above is conclusive, a reference to their description demonstrates at once that it was Blainville's *C. lineolatus* that they thought was conspecific with their New Zealand shell, and they marked one of their varieties as a variety of that shell; probably the true *longicymba* had come off its card and a shell of the other species had been wrongfully placed upon it.

Blainville and Rochebrun both affirm that the type of *Chiton longicymba* was collected by Péron and Lesueur at Île King. It was probably a specimen washed up on the beach; I have seen similar ones come ashore in South Australia. Of course, until it is rediscovered in King Island, the locality must be a little uncertain, for I myself saw in the Museum in Paris specimens of *Chiton hirtosus*, Péron, = *Liolophura georgiana*, Q. and G., and *Acanthopleura gemmata*, Blain., both under the name of *Chiton hirtosus*, Péron, and both stated in Péron's handwriting as having come from "Île King", whereas they had most certainly been collected later on in Western Australia.

STENOCHITON PALLENS, Ashby, 1900.

(Trans. Roy. Soc. of S. Austr., vol. xxiv, 1900, p. 86, Ashby; loc. cit., vol. xlii, 1918, pp. 75, 76, pl. xiv, fig. 14a, b) = *S. juloides*, Ad. and Ang., of Sykes (Proc. Malac. Soc., vol. ii, pt. 2, July, 1896, p. 86), Gatliff and Gabriel (Proc. Roy. Soc. of Vict., vol. xxx, pt. 1), Ashby (Proc. Roy. Soc. of Vict., xxxiii, N. Ser., 1921).

The few known specimens of this very distinct *Stenochiton* have all with one exception been dredged by Sir Joseph Verco in South Australia; the exception is in the Bracebridge Wilson Collection, dredged in Victoria, and wrongfully referred to the previous species by Sykes.

The general coloration is cream, and while we cannot affirm for certain that they live on "Sea-Grasses", there is ample justification for our assuming that they do so.

A protective coloration is common to all the other known members of this genus, and we may assume that this species lives on old or dying leaves of "Sea-Grasses", or that it belongs to such depths that the usual green colour of these plants is much modified.

The great breadth in proportion to the longitudinal length of the anterior valve easily distinguishes this species from its congeners.

STENOCHITON CYMODOCEALIS, Ashby, 1918.

(Trans. Roy. Soc. of S. Austr., vol. xlii, 1918, pp. 70-2, pls. xii and xiv, figs. 1, 4, 5, 11, and 12, *a-e*, Ashby), (Journ. and Proc. Roy. Soc. of W. Austr., vol. vi, pt. 2, 1919-20, Ashby).

This strange little, highly polished *Stenochiton* lives on the cylindrical stems and not on the flat leaves of *Cymodocea*. For this reason it is impossible to flatten out the girdle after death, but by placing the living specimens in a glass tube of sea water some of them will affix themselves to the glass, and if then the water is poured off and the *Chitons* rapidly dried they will dry flat. If allowed to die in the water, which they do quickly, they will relax, fall from the glass, and contract. This little species is often decorated with blotches of pink and white, thereby imitating the colour of the calcareous growths more or less present on the stems of *Cymodocea*.

To find this *Chiton* the plants of *Cymodocea* want pulling up as low down as possible, the specimens usually being found only a few inches above the sand. As before stated, since one was aware of the habits of this species one has found it present in every place where *Cymodocea* has been met with, in South Australia, and, in November, 1920, as far north as Geraldton in Western Australia.

Dr. W. G. Torr and myself for twenty years had worked over stones buried in beds of *Cymodocea* without discovering this species, whereas one had only to spend a few minutes in examining the stems of the sea-grass through which we were wading to have found a number of specimens.

STENOCHITON POSIDONIALIS, Ashby, 1918.

(Trans. Roy. Soc. of S. Austr., vol. xlii, 1918, pp. 72-4, pls. xiii and xiv, figs. 2, 6, and 13, *a-d*, Ashby), (Journ. and Proc. Roy. Soc. of W. Austr., vol. vi, pt. 2, 1919-20, Ashby).

In this species both the anterior and posterior valves are very long, and the former is distinctly concave and the latter slightly so. In colour and markings it is extremely variable; the general colour is green or greenish-brown, but I have taken specimens that are bright orange, others with a dark-brown dorsal line, and again magpie-marked, blotched with dark brown with a pale ground colour.

In some localities they rarely exceed 10 mm. in length, whereas in others they are more than double, and often of a very brownish colour. This species also occurs freely in Western Australia, where the magpie or blotched variety is more numerous than in this State.

It lives usually just above the sand, on the ribbon-like leaves of *Posidonia*; it is necessary to pull up the host plant from very low down or the *Chiton* may be left behind.

STENOCHITON (*ZOSTERICOLA*) *PILSBRYANUS*, Bednall.

(= *S. pilsbryanus*, Bednall, of Ashby, Trans. Roy. Soc. of S. Austr., vol. xliii, 1919, pp. 66-9, pl. xi, figs. 2a-c.)

The sub-genus *Zostericola*, Ashby, was made for the reception of this short and broad *Stenochiton*, whereas all the previously known forms are very much elongated and proportionally narrow. In common with all the other members of this genus, its shell is smooth, highly polished, and practically without sculpture, and it lives on *Zostera* and *Posidonia*. Up to the present only two specimens have been recorded:—the adult type collected by the late Professor Ralph Tate and described by the writer, and a juvenile specimen was taken and described by the writer (loc. cit., p. 69).

The convex character of the anterior valve and the proportionally greater width of the shell separates this species from its congeners.

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